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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,853	01/02/2002	Thomas Potter	SCHO0065	1468
22862	7590	10/06/2005	EXAMINER	
GLENN PATENT GROUP 3475 EDISON WAY, SUITE L MENLO PARK, CA 94025			HAN, QI	
			ART UNIT	PAPER NUMBER
			2654	

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/936,853	POTTER, THOMAS	
	Examiner	Art Unit	
	Qi Han	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☒ Claim(s) 27 and 28 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>09/10/2001</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

U.S.C. National Stage Application

1. Acknowledgement is made of the indication that the present application is filed under 35 U.S.C. 371, of the indication that the required form PCT/DO/ED/903 is present, and of the use of transmittal form PCT/DO/EO/1390. Thus, the present application is being treated as a filing under 35 U.S.C. 371.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The references listed in the Information Disclosure Statement submitted on 09/10/2001 have been considered by the examiner (see attached PTO-1449).

Specification

4. The abstract of the disclosure is objected to because the length is over 150 words and the form and legal phraseology often used in patent claims, such as "means", "said", appear in the abstract, which should be avoided. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The disclosure is objected to because of the following informalities:

On page 73, line 4 of paragraph 4, the word "stenography" appears to be--steganography--

-. Appropriate correction is required.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4 and 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 4, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

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Regarding claim 15, the phrase "such as e.g." renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claim 16, the claim recites "wherein a similarity threshold can be predetermined such that the means for determining formulation alternatives determines similar formulation variants for **the** text **the** semantic differences of which with respect to **the** original alternative are below the similarity threshold, whereas formulation alternatives **the** semantic differences of which with respect to the original alternative are above the similarity threshold are rejected". The whole claim is unclear so as to be indefinite. It appears that the "such that" clause is not completed and/or has grammar error. Further, the limitations of "**the semantic differences**" and "**the** original alternative" lack sufficient antecedent basis in the claim(s). Furthermore, saying "semantic differences (the bigger the less similar)... are above the similarity threshold (the higher the more similar)" is not descriptive, and it doesn't make any sense.

8. Claim 17 recites the limitation "**the** similarity threshold" in lines 2-3 of the claim. There is insufficient antecedent basis for this limitation in the claim. As best understood, the claim is interpreted as dependent claim of claim 16 (not claim 1).

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 16-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 16, because the claimed limitation is indefinite and/or not descriptive (see rejection under 112 2nd above), the claimed subject matter was not described in the specification in such a way as to enable one skilled in the art to make and/or use the claimed invention, without undue experimentation.

Regarding claim 17, it now depends on claim 16 (see rejection under 112 2nd above). The rejection is based on the same reason described for claim 16, because the dependent claim inherits all limitations of its parent claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 3-4, 9-10, 12-13, 15, 18-20 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over BENDER et al. (IDS: "Techniques for data hiding", IBM systems Journal. VOL 35 NOS 3&4. 1996) hereinafter referenced as BENDER.

As per **claim 1**, BENDER discloses techniques for data hiding (title), comprising:

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“providing the text” (page 332, left col., paragraph 2, ‘data hiding in text’, ‘soft-copy text’, ‘text file’);

“linguistically analyzing the text to produce text components, the text components being components of the sentence and the sentence, in addition to at least one additional component, having exactly one predicate as component” (page 332, right col., paragraph 1; ‘syntactic (linguistically analyzing) methods that utilize punctuation, and semantic (linguistically analyzing) methods that encode using manipulation of the words themselves’; page 334, right col., paragraphs 1-3, ‘the sentence’ (including one predicate as component) and ‘the word (component)’);

“determining a plurality of formulation alternatives for the text by varying the order of the text components it-self, by ascertaining synonyms for the text components and varying the order of the synonyms for the text components, or by ascertaining synonyms for at least one text component and varying the order of a synonym for the at least one text component and of another text component of the sentence” (page 334, left col., paragraph 3 to right col., paragraph 3, ‘changing the diction and structure of text (varying the order of the text)’, ‘assign two synonyms primary or secondary value’, wherein different methods read on formulation alternatives),

“with every formulation alternative being grammatically correct for the text and having essentially the same meaning as the text, with every sequence and every synonym ascertained having specific partial information allocated thereto”, (page 334, left col., paragraph 1 to right col., paragraph 3, ‘both considered correct usage of commas in a list’ and ‘alternation...can represent binary data (partial information)’, ‘changing the diction and structure of text without

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significantly altering meaning or tone', 'the choice (between synonyms)...represents two bits of data (partial information)'),

"outputting the formulation [alternative] that forms a modified text, with said information to be hidden being hidden in said modified text", (page 334, left col., paragraph 1 and right col., paragraphs 1-2).

But, BENDER does not expressly disclose "**selecting a formulation alternative** from the plurality of formulation alternatives in such a manner that the partial information that is allocated to the selected formulation alternative corresponds at least to part of the information to be hidden". However, BENDER discloses different methods individually (formulations) as stated above, and further teaches that 'in addition, the use of syntactic and semantic methods generally does not interfere with the open space mothers' and 'these methods can be applied in parallel' (page 333, right col., paragraph 3), which means the methods can be applied individually (alternatively) and in combination, based on user preferred selection, as long as no interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify BENDER by specifically providing selecting alternatives including a individual method and possible combination of methods without inference (corresponding to formulation alternatives), for the purpose of providing robust reformatted document with hidden data (BENDER: page 333, right col., paragraph 3).

As per **claim 3**(depending on claim 1), BENDER further discloses "a dictionary/grammar stage such that grammatically correct formulation alternatives are provided", (page 334, left col., paragraph 1 to right col., paragraph 3, 'both considered (grammatically) correct usage of commas in a list' and 'synonym tables (corresponding to dictionary)').

As per **claim 4** (depending on claim 1), as best understood in view of claim rejection under 35 USC 112 2nd (see above), BENDER further discloses “the dictionary/grammar stage has stored synonyms for text components as well unequivocal partial information for each synonym[, such as syntactic, semantic, contextual and statistic information]”, (page 334, right col., paragraphs 2-3, ‘synonym tables (stored synonyms)’, ‘the choice ... presents two bits of data (unequivocal partial information)’ that is necessarily stored for encoding/decoding).

As per **claim 9** (depending on claim 1), BENDER further discloses “each text component comprises at least one word, and wherein the synonyms for each word are stored in the dictionary/grammar stage together with the corresponding partial information, whereas the partial information for each different sequence of text components is predetermined in accordance with modeling of real linguistic laws by declarative rules, constraints or fixed implementations in software”, (page 334, left col., paragraphs 1-3 to right col., paragraphs 1-3, page 334, left col., paragraph 3 to right col., paragraph 3, ‘both considered correct usage of commas’, ‘changing the diction and structure of text without significantly altering meaning or tone’, ‘the choice (between specific synonyms)... represents two bits of data (partial information)’; which read on the claimed “predetermined in accordance with modeling of real linguistic by declarative rules, laws, constraints, or fixed implementations in software”).

As per **claim 10** (depending on claim 9), BENDER further discloses “to utilize a first section of the information to be hidden for the selection of the sequence of the text components and the subsequent sections for the selection of the synonyms, and wherein the sequence of the selected synonyms is a sequence selected from one or several linguistically possible sequences and is independent of the sequence of the text components in the text”, (page 334, right col.,

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paragraphs 1-3, wherein change of the position of the “before” phrase in the sentence reads on the first section, and the ‘two bits of data’ of synonym choice (selection) read on the subsequent sections).

As per **claim 12** (depending on claim 1), BENDER further discloses “linguistically analyzing is arranged to deliver no text components for which the correctness of the reformulation cannot be guaranteed and/or wherein the means for determining formulation alternatives is arranged to offer only such formulation alternatives for which it is ensured that the analysis thereof can yield again the same sentence of formulation alternatives”, (page 334, right col., paragraphs 2-3, BENDER teaches not using ambiguity of form, and discloses the meaning interference problems for choice of the synonyms, which suggests not using an ambiguous text component for hiding data, as claimed).

As per **claim 13** (depending on claim 1), the rejection is based on the same reason described for claim 1, because the rejection for claim 1 covers the same or similar limitations as claim 13, wherein the text in BENDER is applicable to “public text” and the data hiding (hidden) in the text read on “secret data”.

As per **claim 15** (depending on claim 1), as best understood in view of claim rejection under 35 USC 112 2nd (see above), the rejection is based on the same reason described for claim 7, because the rejection for claim 7 covers the same or similar limitations as claim 15.

As per **claim 18** (depending on claim 1), BENDER further discloses “dynamically determine the formulation alternatives and to dynamically produce the partial information allocated to each formulation alternative”, (page 334, right col., paragraph 3, ‘to automatically

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generate synonym table (dynamically determine synonym alternatives)', 'where there are many synonyms ...can be encoded per substitution').

As per **claim 19** (depending on claim 1), the rejection is based on the same reason described for claim 1, because the rejection for claim 1 covers the same or similar limitations as claim 19.

As per **claim 20**, it recites apparatus (device) for extracting information hidden in a modified text. The rejection is based on the same reason described for claim 1, because the claim recites the same or similar limitations with reversed operation of claim 1.

As per **claim 23** (depending on claim 20), the rejection is based on the same reason described for claim 105, because the claim recites the same or similar limitations as claim 10.

As per **claim 24** (depending on claim 20), the rejection is based on the same reason described for claims 3 and 9, because the claim recites the same or similar limitations as claims 3 and 9.

As per **claim 25**, it recites a method. The rejection is based on the same reason described for claim 1, because the claim recites the same or similar limitations as claim 1.

As per **claim 26**, it recites a method. The rejection is based on the same reason described for claim 20, because the claim recites the same or similar limitations as claim 20.

11. Claim 2 is are rejected under 35 U.S.C. 103(a) as being unpatentable over BENDER in view of admitted prior art hereinafter referenced as Admission.

As per **claim 2** (depending on claim 1), even though BENDER's disclosure necessarily includes a parser for analyzing syntactic and/or semantic (linguistic) structure of a text

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(sentence), BENDER does not expressly disclose the parser being “a highly lexicalized, unification-based parser and specifically an HPSG parser”. However, the feature is well known in the art evidenced by Admission, who indicates that “the standard work for realizing the same” is disclosed by Pollard and Sag (specification: page 77, paragraph 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify BENDER by specifically providing a parser that realizes the same work as HPSG parser, as taught by Admission, for the purpose of increasing robustness for the methods of data hiding in text (BENDER: page 333, right col., paragraph 3).

12. Claims 5-8, 11, 14 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over BENDER in view of WAYNER (IDS: “Disappearing Cryptograph, ISBN 0-12-738671-8, May 1996).

As per **claims 5** (depending on claim 1), BENDER does not expressly disclose “each sequence of the text components and each synonym ascertained has a weighting allocated thereto as partial information, said weighting being determined such that all weightings for the sequence and the synonyms together, respectively, yield a probability of 1, and wherein the means for selecting is arranged to select one formulation alternative each in accordance with the rules of arithmetic decoding, controlled by the secret data that are understood as coded data.” However, the feature is well known in the art as evidenced by WAYNER who, in the same field of endeavor, discloses Disappearing Cryptograph (Book title), comprising using ‘Huffman trees (each tree necessarily includes total weightings of all paths being probability of 1-- the nature of Huffman coding)’, ‘the weightings are used to build a tree’, and ‘converted into 2ⁱ different

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choices each with equal weighting' (page 104, paragraphs 1-3, and Fig. 7.3); and 'these rules (corresponding to rules of arithmetic decoding) can be expanded arbitrarily' (page 117, paragraph 2); and 'a Huffman tree that converts bits into productions' for different variables (Figs. 7.4-7.6), which read on the claim). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify BENDER by specifically providing Huffman tree (coding) with weightings for the different possible choices and the corresponding rules for text parsing, as taught by WAYNER, for the purpose of offering optimal way to compress and/or encode information (WAYNER: page 104, paragraph 1).

As per **claim 6** (depending on claim 1), the rejection is based on the same reason described for claim 5, because the rejection for claim 5 covers the same or similar limitations as claim 6, wherein 'Huffman tree' in WAYNER is corresponding to Huffman code words.

As per **claim 7** (depending on claim 5), BENDER in view of WAYNER further discloses "the information to be hidden comprises a bit sequence, wherein the means for selecting is arranged to take as many bits from the beginning of the bit sequence until the number constituted by these bits is unequivocally within a specific one of the probability intervals determined by said weightings, whereupon said means for selecting selects that formulation alternative that corresponds to the weighting allocated to the specific probability interval, whereupon said means for selecting carries out additional interval interleaving in order to select the next formulation alternative" (BENDER: page 334, left col., paragraph 1 to right col., paragraph 3, 'two bit of data (a bit sequence)'; WAYNER: page 94, paragraph 3, 'the bits were hidden'; page 104, paragraph 2, 'Huffman tree ...approximates the desired statistical outcome (corresponding to probability)', wherein each branch of the tree necessarily associated with a

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probability interval when the weightings is determined; 115, Fig. 7.5, shows different variables related to a Huffman tree (interpreted as additional interval interleaving); page 118, paragraph 3, 'grammar-based mimic functions' 'measured probabilistically').

As per **claim 8** (depending on claim 1), the rejection is based on the same reason described for claim 6, because the rejection for claim 6 covers the same or similar limitations as claim 8.

As per **claim 11** (depending on claim 1), the rejection is based on the same reason described for claim 6, because the rejection for claim 6 covers the same or similar limitations as claim 11, wherein Huffman tree (and the corresponding coding) is also for compressing the information.

As per **claim 14** (depending on claim 13), the rejection is based on the same reason described for claim 6, because the rejection for claim 6 covers the same or similar limitations as claim 11, wherein Huffman tree (and the corresponding Huffman coding) is also for compressing the information and using statistical characteristics of the analyzed text (public text) is an inherent nature of Huffman coding.

As per **claim 21** (depending on claim 20), the rejection is based on the same reason described for claim 5, because the claim recites the same or similar limitations as claim 5.

As per **claim 22** (depending on claim 20), the rejection is based on the same reason described for claim 6, because the claim recites the same or similar limitations as claim 6.

Allowable Subject Matter

13. Claims 27-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the allowable subject matter:

Regarding **claim 27** (depending on claim 1 or 20), the instant application is directed to an apparatus (device) for hiding information in a text or for extracting information hidden in a modified text. The dependent claim, in addition to contain all its parent limitations, identifies the uniquely distinct features of determining formulation alternatives or producing partial information (recited in the parent claims 1 and 20) being arranged to utilize a word memory in the form of a tree or graph consisting of (a) full word forms, i.e. inflected words which then are correlated to other inflected words or (b) morphologic syntactic breaking down of the words in accordance with inflection classes, and in particular splitting into word prefixes, radices and suffixes, in which only the word radices or word prefix/word radix combinations are explicitly correlated as synonyms and the respective inflected forms are analyzed in accordance with the current demand in the respective word present on the basis of inflection data, and are generated correspondingly for a selected synonym.

Regarding **claim 28** (depending on claim 27), it inherits all limitations of its parent claim(s).

The prior art of record; BENDER (IDS), WAYNER (IDS), Admission, Orrin (US 6011849), provided numerous teachings of methods and techniques for hiding data in text, including using open space, syntactic and semantic methods, taking advantage of alternation of

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punctuations, components positions (or orders) of sentences, synonyms and their possible combinations, providing parser with GNF grammar, Huffman tree with weightings, grammar-based mimic functions measured probabilistically, and using HPSG (head drive phrase structure grammar) parser and encryption-based selection system for steganography. However, the combined features, as stated above, are not anticipated by, nor made obvious over the prior art of the record.

14. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

15. Please address mail to be delivered by the United States Postal Service (USPS) as follows:

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Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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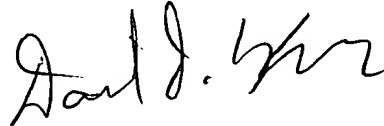
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Randolph Building
Alexandria , VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (571) 272-7604. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richmond Dorvil, can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

QH/qh
September 30, 2005



DAVID D. KNEPPER
PRIMARY EXAMINER